But this equation is satisfied by $U=0$, $HU=0$; consequently the equations

$$\alpha U+6\beta HU=0, \qquad H(\alpha U+6\beta HU)=0,$$

are both satisfied by the relations

$$U=0, \qquad HU=0.$$

Hence the theorem given in the text.

VI. "On a Class of Invariants." By JOHN C. MALET, M.A., Professor of Mathematics, Queen's College, Cork. Communicated by Professor CAYLEY, LL.D., F.R.S. Received December 14, 1881.

(Abstract.)

This paper is concerned with two kinds of functions of the coefficients of Linear Differential Equations, which have certain invariant properties.

In the first part of the paper it is shown that every Linear Differential Equation possesses a certain number of functions of the coefficients which are unaltered by changing the dependent variable y to yu where u is any given function of x, the independent variable. These functions bear remarkable analogies to functions of the differences of the roots of ordinary algebraic equations, and many problems, provided they involve only the ratios of the solutions of the differential equation, may be solved in terms of them; for example, the condition that two solutions y_1 and y_2 of a linear differential equation of the third order should be connected by the relation $y_1=y_2x$ is expressed in terms of two such functions of the coefficients of the equation. This problem is analogous to that of finding the discriminant of an algebraic binary cubic.

The second part of the paper is concerning functions of the coefficients of Linear Differential Equations which are unaltered by change of the independent variable, and the theory of these functions is applied to the solutions of problems involving only relations among the solutions of the equation without the independent variable.

In this part of the paper it is shown how to form the condition that the three solutions y_1, y_2, y_3 of a linear differential equation of the third order should be connected by the relation $y_1y_2=y_3^2$, which relation, involving only ratios of the solutions, and not containing the independent variable, can be expressed in terms of either class of the functions of the coefficients considered in the paper; these two methods of writing the condition are accordingly given.